

MONTHLY WEATHER REVIEW,

APRIL, 1878.

WAR DEPARTMENT,

Office of the Chief Signal Officer,

DIVISION OF

TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

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INTRODUCTION.

In compiling the present REVIEW the following data, received up to May 13th, have been made use of, viz: the regular tri-daily weather charts, containing the data of simultaneous observations taken at one hundred and thirty Signal Service stations and twelve Canadian stations, as telegraphed to this office; monthly journals and means, one hundred and three and one hundred and twenty-nine respectively, from the former, and monthly means from thirteen of the latter; reports from twenty-five Signal Service Sunset stations; two hundred and thirty-seven monthly registers from Voluntary Observers; forty-nine monthly registers from United States Army Post Surgeons; Marine Records; International Simultaneous Observations; monthly reports of the Weather Services of the States of Iowa and Missouri; reliable newspaper extracts; special reports.

BAROMETRIC PRESSURE.

Upon chart No. II is shown the general distribution of the atmospheric pressure for the month by the isobaric lines. Compared with the means for April of previous years, the pressure for the present month averages decidedly lower, especially in the Northwest.

The local barometric ranges, as reduced to sea-level, for the month, vary as follows: New England, from 1.00 inch on Mt. Washington to 1.26 at Eastport. Middle Atlantic States, 0.80 at Lynchburg to 1.09 at Sandy Hook. Lower Lake region, 0.81 at Cleveland to 0.91 at Oswego and Toledo. Upper Lake region, 0.87 at Chicago to 1.35 at Duluth. Upper Mississippi valley, 0.82 at St. Louis to 1.29 at St. Paul. Missouri valley, 0.84 at Bismarck to 1.19 at Yankton. Red River of the North Valley, 1.06 at Pembina to 1.28 at Breckenridge. Plains of Nebraska and Kansas, 1.21 at Dodge City to 1.47 at North Platte. Rocky Mountain region, 0.80 at Cheyenne to 0.99 at Deadwood. Between Rocky Mountains and Pacific States, 0.50 at Yuma to 0.75 at Salt Lake City and 0.92 at Winnemucca, Nev. California, 0.31 at Campo to 0.66 at Red Bluff. Texas, 0.76 at Indianola to 1.00 at Fort Concho. Ohio valley and Tennessee, 0.62 at Nashville to 0.77 at Pittsburg. South Atlantic States, 0.65 at Jacksonville to 0.93 at Cape Lookout. Gulf States, 0.52 at Mobile to 0.80 at Shreveport and 0.46 at Key West.

Areas of High Pressure.—Seven are described. None of these have been decided.

No. I.—This is a continuation of the high pressure-area spoken of in the March Review as No. X. 1st, it covered the country from Oregon to the Missouri valley, with cold and generally clear weather; a. m. barometer at Virginia City 0.26 in. above normal, and Pike's Peak minimum temperature 3° Fah. 2nd, was central in Montana, but with slightly diminished pressure. 3rd, it moved eastward into the region between the Rocky Mountains and Missouri river, with diminished pressure. 4th, p. m. barometer at Santa Fé 0.13, and midnight at Corsicana, Tex., 0.16, above normals. 5th, central in New Mexico, after which it was dissipated.

No. II—gradually formed between storms I and II on the 7th. 8th, morning, it reached from the Lower Lakes to the North Carolina coast, with freezing temperatures from northeastern New England northward; midnight, central in the lower St. Lawrence valley. 9th, a. m. barometer at Eastport 0.38 above normal, and temperature below freezing from Nova Scotia and northern Maine northward. 10th, a. m., central on the New England coast, and then disappeared to the eastward, in advance of storm III.

No. III—appeared in Oregon on the 6th, where the pressure gradually increased until it reached its maximum, 0.17 above normal, a. m. of the 9th. The latter morning it extended southeastward over Utah, and the temperature fell below freezing from Montana and eastern Oregon to Nevada. 10th, morning minimum temperatures below freezing from Nevada, Utah and New Mexico northward; -19° on Pike's Peak. The pressure increased toward Texas. 11th, it disappeared over the country from Arizona to Texas, apparently to the southward, also eastward over the Gulf States.

No. IV.—This high pressure-area was central, morning of the 14th, north of the Upper Lakes, with freezing temperatures in northern Michigan. 15th, a. m. barometer at Marquette 0.20 above normal. During the day it extended southeastward over New England. 16th, a. m. barometers at Marquette 0.24, and Portland, Me., 0.29, above normals. 17th, a. m. barometer 0.36 above normal at Chatham, N. B., and freezing temperatures from Nova Scotia to the mouth of the St. Lawrence. 18th, a. m. barometer 0.48 above normal at Sydney, Cape Breton, and then rapidly passed to the eastward, also southward along the coast.

No. V.—advanced southeastward, night of the 22nd, over the mouth of the St. Lawrence. 23rd, a. m. barometer at Father Point, Ont., 0.35, and midnight at Sydney, C. B., 0.46, above normals. The remainder of the month it remained almost stationary over Nova Scotia and the Gulf of St. Lawrence, oscillating backwards and forwards, with the barometer at Sydney, C. B., 0.45 above the normal the last day.

No. VI.—22nd, the pressure rose somewhat above the normal along the Pacific coast. 23rd, it extended eastward across the Rocky Mountain range. 24th, the barometers at Cheyenne and Santa Fé 0.10 above normals. 25th, it withdrew to the southwestward; at midnight it reached from California to New Mexico. 26th, remained about stationary. 27th, moved to Utah, Nevada and California; midnight barometer at San Francisco 30.20 in., or 0.13 above normal. 28th, continued northward toward Oregon. 29th, barometer at Portland, Or., 30.37, or 0.24 above normal. 30th, it apparently disappeared to the northward.

No. VII.—27th, it advanced southward over Minnesota; barometer at Duluth 0.12 above normal. 28th, highest over Lake Superior, and later disappeared.

Areas of Low Pressure.—Of these ten have been traced and charted. Nos. I, II, V and VI developed into very severe storms.

No. I.—2nd, it advanced northward over Florida at night. 3rd, the pressure diminished very rapidly; barometer at Wilmington fell to 29.37 in., or 0.65 below the normal. It developed into two distinct depressions, with heavy rains and occasional thunder-storms from Florida to North Carolina, and easterly gales on the coast. The schooner "Steelman" was struck by the high NW. winds following it off Pensacola, and driven to Key West. 4th, the secondary depression disappeared, as shown on chart No. I. The storm-center moved northeastward off the coast, producing heavy gales, at times of hurricane force, high seas, and heavy rains. At Kittyhawk, N. C., the barometer fell 0.73 below the normal. During the three first days of the month, the pressure continued low in Nova Scotia, evidently due to the storm described as No. XVII in the March Review, and, now, again began decreasing. 5th, it reached the coast of Nova Scotia, producing northeasterly gales, with rain and snow, thence to the mouth of the St. Lawrence. 6th, the barometer at Halifax fell to 28.83, or 1.00 below the normal. Cautionary Signals were ordered the 3rd, from North Carolina to New Jersey, and the 4th for the New England coast. Warnings were also sent, night of the 4th, for Canadian stations in Nova Scotia, New Brunswick and the St. Lawrence valley. Except for the New England and northern New Jersey coasts, all were justified. Maximum hourly velocities—Key West, NW, 44; Jacksonville, W. 34; Cape Lookout, E. 60; Cape Hatteras, NE. 72; Kittyhawk, NE. 64; Cape May, NW. 38; Eastport, NE. 26; Father Point, E. 52 miles.

No. II.—This severe storm evidently resulted from the combination of two disturbances, one of which apparently advanced northeastward over Texas, producing frequent rains from thence to Indian Territory and New Mexico on the 7th. The other was felt on the 7th at Victoria, British Columbia, as a SW. gale, and at Umatilla, Or., as a W. gale of 60 miles hourly velocity, while the pressure rapidly diminished from Montana to Minnesota. 8th, threatening and rainy weather, with frequent thunder-storms, was reported from the Gulf States to the Upper Lakes and Northwest. From western Dakota to Colorado northerly gales prevailed, with heavy snow at places. The two united, and were central in eastern Nebraska by midnight. At Omaha the barometer fell 0.81 below the normal. 9th, as the storm progressed northeastward over Minnesota, the central pressure continued diminishing, the barometer at St. Paul falling to 28.85, or 1.00 below the normal. A barometric trough ran southward into the Gulf. The rain-area extended eastward over the Lake region, Middle States and South Atlantic States, with frequently heavy thunder-storms and occasional hail. Clear weather prevailed in the Southwest; northwesterly gales, with snow, from Colorado and western Nebraska to Montana and western Dakota. 10th, the barometers fell at Breckenridge, St. Paul and Duluth to, respectively, 28.85, 28.83 and 28.78, or 1.07, 1.09 and 1.10 below the normals. The center passed northeastward into Canada, with the barometric trough reaching to the South Atlantic coast. During this and the preceding days the barometric gradient was unusually steep from the Northwest to the

Upper Lakes, producing very stormy weather, the winds at times reaching a hurricane force, and causing considerable damage. Clear and clearing weather followed from the Gulf States to the South Atlantic States, Ohio valley and Missouri valley, while the rain-area extended to New England. 11th, the winds diminished in force in the Lake region, with clearing weather. Cautionary Signals were displayed on the 7th along the West Gulf coast; on the 8th along the East Gulf and Atlantic coasts, except Maine, and at all the Lake stations. Warnings were also telegraphed the 8th for the Canadian stations, along Lakes Huron, Erie and Ontario, and in the Upper St. Lawrence valley. They were justified, except along the New England coast and Lake Ontario and at Key West. Maximum velocities—Indianola, W. 36; Mobile, SE. 30; Charleston, SE. 33; Smithville, N. C., S. 42; Kittyhawk, SE. 50; Barnegat and Atlantic City, E. 25; Erie, SE. 43; Toledo, SW. 45; Alpena, SW. 28; Grand Haven, SW. 36; Milwaukee, SW. 54; Escanaba, S. 48; Marquette, SE. 34; Duluth, NE. 48; St. Paul, SE. 36; Breckenridge, N. 42; La Crosse, S. 44; Davenport, SW. 48; Cairo, SE. 46; Leavenworth, SW. 52; Yankton, NW. 48; Bismarck, NW. 60; Dodge City, N. 44; North Platte, NW. 66; Cheyenne, NW. 37; Pike's Peak, NW. 52 miles.

No. III—gradually formed as a subsidiary depression to No. II, and was central afternoon of the 11th on the Middle Atlantic coast, with fresh to brisk winds. Thunder-storms occurred from the South Atlantic coast to southern New England. 12th, it increased very much in intensity as it moved northeastward along the coast. The barometer at Portland fell to 29.29, or 0.61 below the normal. High northwesterly winds, or gales, prevailed in the Middle Atlantic States and southern New England. 13th, a. m. barometer at Eastport 29.26, or 0.65 below the normal. It disappeared to the eastward over Nova Scotia. Signals were displayed night of the 11th along the eastern New England coast, and all justified. Warnings were dispatched a. m. of the 12th for the Canadian stations in Nova Scotia and New Brunswick. Maximum velocities—Cape May, N. 40; Sandy Hook, W. 43; New London, E. 26 and NW. 27; Boston, SE. 35; Eastport, E. 30; Father Point, E. 45; Mt. Washington, E. 54 and NW. 66 miles.

No. IV.—It is quite probable that this storm originated on the 12th between the Pacific coast and the Rocky Mountains, and then extended eastward toward the lower Missouri valley, Indian Territory and northern Texas. 13th, the p. m. barometers at Salt Lake City and Dodge City read 0.47 below the normals. At Julian, southern California, a severe rain and wind-storm prevailed; at Winnemucca, Nevada Territory, heavy snow-storm; at Fort Sill, Indian Territory, thunder and hail-storm; at Cottonwood Falls, Emporia and Kirksville, Kan., a tornado, with very large hail, sweeping cars from the railroad track and killing several persons. The midnight barometer at Virginia City fell 0.49 below the normal. 14th, frequent rains fell from the Gulf States to Ohio, Lake Michigan and the Northwest, with occasional thunder-storms; destructive hail-storm occurred at Lamar, Mo.; heavy snow in Utah and southern Nevada. 15th, while the pressure continued low in Kansas, a subsidiary depression formed in the Gulf States, producing heavy thunder-storms at places. At Waterville, Kansas, a waterspout is reported to have formed. 16th, the subsidiary depression passed eastward over southern Georgia. The pressure having been high to the northward, northeasterly gales and heavy rains occurred along the North Carolina coast, for which signals had been displayed the previous day. At Cape Lookout, NE. 48; Kittyhawk, NE. 44; Cape Henry, NE. 48 miles. 17th, the main depression united with the following storm, as shown on chart No. I.

No. V.—13th, light rains fell in Washington Territory and Oregon, with a heavy hail-storm at Eugene City, Or. 14th, the barometers at Portland, Or., and San Francisco read 0.44 below the normals. Light rains prevailed in California; at Julian, Cal., heavy rain-storm, turning into a blinding snow-storm at night. 15th, a. m. barometer at San Francisco 0.48 below normal, and the storm-center passed into the interior. Heavy rains accompanied it in California and light snow in Nevada. 16th, heavy snow fell in northern Arizona, Utah and southern Montana, and light rains in the southern portions of California and Arizona. Southerly gales began from New Mexico and northwestern Texas to Wyoming and western Dakota. 17th, the barometers at Cheyenne and North Platte fell, respectively, 0.58 and 0.68 below the normals. Gales prevailed from the Northwest to Colorado and Indian Territory, with threatening and rainy weather and frequent thunder-storms; heavy snow from Montana and Wyoming to Utah; on Pike's Peak, severe snow-storm, with the temperature 9° below zero; at Leavenworth, Kan., and Olivet, Dak., tornadoes; at Deadwood, Dak., ("Black Hills,") heavy rain-storm. 18th, its progress was very slow. The a. m. barometer at Bismarck read 0.72 below the normal, but the central depression rose during the day. Rainy weather and southeasterly gales continued in Minnesota and Dakota, changing into a severe snow-storm at Deadwood; to the southwestward of the storm-center, as far as Colorado, westerly gales, with clear or clearing weather. 19th, it continued diminishing in force, but with frequent thunder-storms and hail in the Upper Mississippi valley and Upper Lake region. A barometric trough reached southward into Texas, in which, as the wind suddenly shifted from southerly to northerly, it became destructive at places; at Fort Concho, Tex., a heavy hail and rain-storm resulted, causing great damage—hail two feet deep in places—the northwest wind blew with hurricane force for some time. 20th and 21st, during its passage northeastward, rainy weather, occasional thunder-storms and brisk to high westerly winds accompanied it from the Lower Lakes and Middle States eastward. The Signals displayed on the Texas coast the 17th were not justified; those on Lakes

Michigan and Superior, night of the 17th, were lowered too soon; of those along the New Jersey and North Carolina coast, the latter were not justified. Maximum velocities—San Francisco, SW. 28; Pike's Peak, SW. 64 and NW. 56; Fort Bayard, N. M., SW. 43; Fort Craig, N. M., SW. 40; Denver, W. 50; Cheyenne, NW. 44; Colorado Springs, W. 60; North Platte, SE. 96 and W. 66; Dodge City, SE. 40 and SW. 52; Bismarck, E. 74 and N. 60; Breckenridge, E. 50; St. Paul, SE. 33; Duluth NE. 30; Marquette, SE. 36; Milwaukee and Port Huron, W. 36; Sandy Hook, W. 30; Thatcher's Island, W. 36; Mount Washington, NW. 102 miles. Warnings were sent, night of the 17th, for the Canadian stations on Lakes Huron and Erie.

Nos. VI and VII.—18th, the pressure rapidly diminished along the Pacific coast, with a high wind at Victoria, British Columbia. 19th, continued diminishing; barometers falling below normals 0.47 at San Francisco and 0.53 at Portland, Or. Light rains fell from Washington Territory to California. 20th, a. m. barometer at Salt Lake City 0.42 below normal, and diminishing pressure from the Missouri valley southward. The rain-area extended eastward partly as snow to Montana, Idaho, Utah and Arizona. 21st, p. m. barometer at Yankton 0.58 below normal. Threatening and rainy weather prevailed from the Upper Lakes to the Northwest, with frequent thunder-storms; severe hail-storms in Iowa and Illinois; tornado in northwestern Iowa. 22nd, it appeared as an extensive barometric trough, reaching from Minnesota to Texas, and No. VII developed. Rainy weather was reported from the Southwest to the Northwest and Lake region. 23rd, generally light rains fell in the Lake region; frequently very heavy rains and destructive thunder-storms, with hail, from the lower Ohio valley and Missouri to Alabama and eastern Texas; tornadoes at Corsicana, Texas, and Green Springs, Alabama. 24th, passed northward over Lower Michigan, but with frequent rains and heavy thunder-storms from the Lake region southward; at Rome, Ga., a tornado; midnight barometer at Alpena 0.81 below normal. Cautionary Signals were ordered the 22nd for Lakes Superior and Michigan, but late, also from New Jersey to North Carolina; 23rd, for the Gulf coast, and from North Carolina to New Jersey; 24th, for the Lower Lakes and southern New England. Maximum velocities—San Diego, S. 32; Salt Lake City, S. 32; North Platte, E. 60; Bismarck, NE. 60; Cairo, SW. 55; Galveston, NW. 40; Cape Lookout, S. 72; Sandy Hook, E. 36; Cleveland, SW. 45; Detroit, S. 42; Duluth, NE. 38 miles.

No. VIII.—developed the 25th in southern Michigan from No. VII. 26th, 27th and 28th thunder-storms were frequent in the Middle States, and heavy at places with hail. The last day very destructive hail storms occurred in southeastern Virginia, Maryland and Delaware. 29th, it was dissipated, as shown on the chart. Cautionary Signals on the New Jersey and New England coasts were not justified except at Eastport; those on the North Carolina coast were late. Maximum velocities—Cape Lookout and Hatteras, SW. 36; Eastport, NE. 35.

No IX.—was not of much importance. Moderate rains fell in Cuba and southern Florida, accompanying thunderstorms, with very brisk southeast winds at Key West.

No. X.—Light rains accompanied this disturbance from the Northwest to the Upper Lakes, with occasionally high winds; Bismarck, W. 42; Breckenridge, NW. 35; Milwaukee, SW. 34 miles.

INTERNATIONAL METEOROLOGY.

STORMS.—December 31st—York Factory, Hudson's Bay, B. A., noon, heavy northerly gale commenced reaching a velocity of 47 miles at midnight, and from midnight to 2:45 a. m., January 1st, averaged 71 miles per hour, with squalls estimated at 100. At 2:45 a. m. the anemometer was blown away, and the following velocities were estimated: 2:45 a. m. to 6:33 a. m., average 50 miles, and 6:33 a. m. to 9 a. m., average 40 miles. It was preceded by fresh southerly winds on the 30th, and followed by cold and strong NW. winds until the 6th; the thermometer registering -33° on the morning of the 3rd, the lowest reading recorded during the months of December, January and February.

January—4th, 51° S., 81° W., heavy SE. winds. 8th, 49° N., 7° W., heavy sea. 21st, off San Francisco, 5:30 p. m., SE. gale, rain. 22nd, off San Francisco, 4:30 a. m., SE gale increased; 11 a. m., tremendous sea.

February—3rd, $28^{\circ}06'$ S., $53^{\circ}12'$ E., violent rotary gale, lasting a few hours. 7th, $29^{\circ}30'$ S., 44° E., terrific NE. gale, veering to NW. and ending at SW.; barometer 29.30; fearful cross-seas, lasting 16 hours; land and sea birds fell on deck exhausted. Tahiti, Society Islands, hurricane; 129 persons reported killed and much property destroyed. 10th, $57^{\circ}55'$ S., 64° W., heavy gales. 15th, $48^{\circ}54'$ N., $18^{\circ}30'$ W., heavy NW. to SW. gale. 16th, outer bank, off San Francisco, terrible gale, with seas mountain high. 20th, Fowey Rocks, Florida Reefs, 5 a. m., wind SSE. and heavy seas, driving steamer Arratoon on reefs.

March—4th, $41^{\circ}19'$ N., $52^{\circ}44'$ W., heavy SSW. gale, with tremendous sea; about 28° N., $67^{\circ}54'$ W., SE. gale going around to SW. and blowing furiously for 48 hours. 11th, $48^{\circ}08'$ N., $46^{\circ}35'$ W., 7:35 a. m., Wash., M. T., barometer 29.39, wind NW. 24 miles; 2 p. m., W. by N., 60 miles; 5:30 p. m., barometer 29.22, lowest point. 12th, 42° N., $44^{\circ}50'$ W., 7:35 a. m., Wash., M. T., barometer, 29.59, wind NW. 60 miles. 13th, 46° N., 45° W., hurricane from W., with heavy sea. 24th, $45^{\circ}17'$ N., $38^{\circ}47'$ W.,

heavy S. gale veering round to NW., lasting 6 hours. 25th, 41° 02' N., 65° 08' W., SSW. and WNW. very stormy. 26th, 41° 28' N., 65° 31' W., fresh W. gale, with heavy snow squalls; 40° 34' N., 70° 40' W., storm, snow and hail squalls. 27th, 43° 26' N., 46° 34' W., severe storm. 29th, 49° 22' N., 5° 43' W., 5 a. m., barometer 28.92 lowest; 7 a. m., furious gale from N. and E.; 9 a. m. to 11 p. m., velocity of wind estimated from 50 to 75 miles. 31st, 49° 35' N., 8° 30' W., N. and NW. stormy.

April—1st, 39° 30' N., 14° 25' W., NW. rising wind, heavy snow squalls. 2nd, 49° 26' N., 20° 15' W., moderate NW. gale, high sea, squally; 53° 28' N., 21° 49' W., fresh NW. gale and heavy hail showers; 49° 41' N., 7° 36' W., strong NW. breeze, heavy rain squalls. 4th, 26° 30' N., 69° W., SE. to NW. gale, lasting five days; 49° 50' N., 36° 26' W., strong ESE. gale; 49° 42' N., 11° 33' W., W. and WNW. wind and high sea; 37° 58' N., 50° W., severe hurricane. 6th, 48° 36' N., 27° 15' W., SE. and ESE. moderate breeze, high sea and rain. 2nd to 7th, lat. 36° 50' to 39° 44' N., long. 53° 16' to 63° 39' W., barometer 28.53 in., S. to WSW. gales, with heavy sea. 7th, 35° 30' N., 69° W., heavy NE. gale. 8th, 45° 29' N., 41° 19' W., W. and ESE. variable wind, very high cross-sea, cloudy and heavy rain; Str. "Anthenian", from Liverpool for Constantinople, capsized during heavy gale between 50 and 60 miles off Scilly. 9th, 48° 53' N., 39° 10' W., E. gale and high sea; 43° 26' N., 47° 30' W., fresh NNE. gale, heavy squalls and high sea; 43° 16' N., 47° 50' W., fresh ESE. and NE. gale, very high sea, heavy rain; 44° 43' N., 44° 32' W., fresh NE. gale and high sea. 10th, 42° 16' N., 54° 54' W., moderate NE. and N. gale, and very high sea. 17th, 43° 50' N., 46° 42' W., fresh westerly breeze to fresh gale and high sea; 45° 32' N., 43° 50' W., fresh NW. breeze and heavy squalls; 48° 05' N., 29° 00' W., SW. changeable winds, heavy squalls. 18th, 42° 08' N., 53° 21' W., and 43° 40' N., 48° 07' W., strong NW. gales, high seas; 36° 50' N., 57° W., SSE. gale, heavy squalls. 19th, 45° 21' N., 39° 15' W., WNW. heavy weather and sea; 50° 58' N., 13° 14' W., strong SSW. gale; 49° 38' N., 23° 07' W., SW. and NW. increasing wind and sea, moderate gale in morning. 20th, 43° 39' N., 48° 47' W., strong NE. to NW. gale and snow-storms; 43° 48' N., 45° 41' W., W. and SE. heavy weather and sea; 49° 08' N., 27° 41' W., hard NW. gale and heavy W. sea; 50° 39' N., 18° 08' W., variable winds, strong gale and high westerly sea; 48° 37' N., 28° 01' W., violent WNW., SW. and NW. gale, very high westerly sea. 21st, heavy gale along northern coast of Spain; 42° 30' N., 56° 14' W., NW. storm and rain; 50° 01' N., 22° 56' W., variable, strong gale and high westerly sea; 47° 06' N., 35° 19' W., NW. and SSE. gale. 22nd, 48° 53' N., 28° 08' W., variable winds, strong gales and high westerly sea; 45° 58' N., 38° 42' N., very heavy SW. and NW. gale, and tremendous NW. sea. 23rd, 48° 08' N., 35° 43' W., strong westerly gale; 47° 53' N., 33° 18' W., strong NNW. breeze and squally. 25th, 43° 00' N., 49° 19' W., W. to N. by W. strong gale; 44° 41' N., 43° 22' W., strong northerly gale, high westerly sea and terrific squalls. 27th, 47° 53' N., 33° 11' W., strong E. gale, high SE. sea.

Ice at Sea.—April 6th, steamer "Northern Light" 3 miles off Cariboo, N. S., in solid field of ice; passengers report Gulf of St. Lawrence and Straits of Northumberland full of ice as far as they could see. 10th, 30 miles east of N'f'd banks, large iceberg. 16th, 46° 45' N., 42° 21' W., very large iceberg. 17th, vessel from St. John's N'f'd, at Halifax, N. S., reports saw ice as far as eye could reach; whole of Cape Breton coast up to Canso blockaded. 18th, White Bay, N'f'd., steamer "Micmac" crushed in ice.

TEMPERATURE OF THE AIR.

The isothermal lines on chart No. II illustrate the general distribution of the temperature of the air for the month. Like the preceding month, the average of the mean temperatures is above that for years in every district, and mostly so in the Lake region, as will appear from a reference to the table on the left side of the same chart.

Minimum and Maximum Temperatures, respectively: *Maine*—at West Waterville, 29° and 65°; Orono, 30°, 68°. *New Hampshire*—Mt. Washington, 15°, 47°; Dunbarton, 34°, 71°. *Vermont*—Woodstock, 28°, 72°; West Charlotte, 36°, 82°. *Massachusetts*—Rowe, 32°, 64°; Somerset, 38°, 80°. *Rhode Island*—Chepachet, 32°, 74°; Newport, 35°, 67°. *Connecticut*—New London, 37°, 72°; Mystic, 36°, 78°. *New York*—Waterburg, 27°, 76°; Moriches, 42°, 78°. *New Jersey*—Vineland, 33°, 85°; Atco, 41°, 82°. *Pennsylvania*—Franklin, 24°, 78°; Cannonsburg, 32°, 89°. *Delaware*—Milford, 41°, 80°; Dover, 46°, 80°. *Maryland*—Woodstock, 34°, 79°; New Market, 40°, 86°. *District of Columbia*—Washington, 42°, 84°. *Virginia*—Wytheville, 31°, 83°; near Keswick Station, 44°, 88°. *West Virginia*—Helvetia, 30°, 86°; Morgantown, 32°, 89°. *North Carolina*—Highlands, 33°, 75°; Weldon, 45°, 90°. *South Carolina*—Aiken, 42°, 84°; Charleston, 46°, 84°. *Arkansas*—Mt. Ida, 38°, 88°; Judsonia, 50°, 85°. *Tennessee*—Knoxville, 37°, 82°; Austin, 42°, 86°. *Kentucky*—Danville, 41°, 80°; Louisville, 42°, 82°. *Ohio*—Lewisburg, 30°, 77°; Ringgold, 36°, 86°. *Indiana*—Richmond, 32°, 77°; St. Meinrad, 45°, 82°. *Michigan*—Fort Wayne, 21°, 73°; Detroit, 29°, 74°; Escanaba, 25°, 63°; Northport, 32°, 78°. *Wisconsin*—Neillsville, 15°, 75°; Embarras, 30°, 78°; La Crosse, 35°, 77°. *Illinois*—Riley, 30°, 75°; Cairo, 44°, 83°; Anna, 46°, 85°. *Georgia*—Gainesville, 42°, 84°; Augusta, 45°, 89°. *Florida*—Milton, 50°, 86°; Okahumpka, 50°, 92°. *Alabama*—Montgomery, 45°, 88°; Mobile, 50°, 86°. *Mississippi*—Brookhaven, 44°, 79°; Vicksburg, 49°, 86°.

Louisiana—Baton Rouge Barracks, 40°, 89°; Okalooska, 46°, 89°; Shreveport, 44°, 88°. *Texas*—Fort McKavett, 34°, 90°; New Ulm, 51°, 92°; Brackettville, 45°, 95°; Rio Grand City, 51°, 109°. *Indian Territory*—Fort Sill, 32°, 91°; Fort Gibson, 36°, 87°. *Missouri*—Corning, 33°, 80°; Oregon, 34°, 87°; Springfield, 40°, 86°. *Iowa*—Logan, 26°, 80°; Guttenburg, 28°, 78°; Fort Madison, 39°, 82°. *Minnesota*—Minneapolis, 27°, 73°; Breckenridge, 25°, 74°. *Dakota*—Pembina, 21°, 76°; Fort Randall, 24°, 80°; Lower Brule Agency, 28°, 81°. *Nebraska*—Fort McPherson, 5°, 80°; Camp Sheridan, 20°, 80°; De Soto, 32°, 86°. *Kansas*—Fort Hays, 29°, 86°; Creswell, 30°, 88°; Empire City, 40°, 96°. *New Mexico*—Fort Union, 15°, 78°; *Montana*—Virginia City, 19°, 65°. *Colorado*—Pike's Peak, —19°, 34°; Fort Garland, 6°, 70°; Denver, 29°, 80°. *Wyoming*—Fort Sanders, 12°, 65°; Camp Brown, 15°, 73°; Cheyenne, 19°, 71°. *Utah*—Coalville, 26°, 69°; Salt Lake City, 30°, 73°. *Idaho*—Boise City, 23°, 77°. *Nevada*—Winnemucca, 24°, 74°; Camp McDermit, 26°, 82°; Pioche, 21°, 75°. *California*—Santa Cruz, 36°, 70°; Red Bluff, 35°, 90°; Los Angeles, 41°, 80°. *Oregon*—Umatilla, 24°, 82°; Roseburg, 29°, 76°. *Arizona*—Tucson, 36°, 94°.

Ranges of Temperature.—The monthly ranges will appear from an examination of the minima and maxima temperatures just given. *Greatest daily ranges*,—vary in New England from 13°, least, on Mt. Washington to 36° at Boston; Middle Atlantic States, 16° at Cape May to 33° at Lynchburg; South Atlantic States, 19° at Cape Lookout to 33° at Augusta; East Gulf States, 14° at Key West to 39° at Montgomery; West Gulf States, 19° at Galveston to 36° at Shreveport and 46° at Fort Griffin; Ohio Valley and Tennessee, 23° at Cincinnati to 34° at Pittsburgh; Lower Lake region, 22° at Oswego to 36° at Erie; Upper Lake region, 19° at Milwaukee to 27° at Duluth and Marquette; Upper Mississippi valley, 24° at St. Louis to 30° at Dubuque; Lower Missouri valley, 28° at Omaha to 41° at Yankton; Minnesota and Dakota, 24° at Bismarck to 42° at Pembina; Colorado, 34° on Pike's Peak to 41° at Denver; Utah, Nevada and Idaho, 29° at Salt Lake City to 40° at Winnemucca; California, 16° at San Francisco to 30° at Los Angeles and 41° at Red Bluff and Yuma.

Ice is reported to have formed as follows: *Dakota*, at Norristown, $\frac{1}{4}$ in., 6th. *Missouri*, at Oregon, 3rd, 11th. *Nebraska*, at Geneva, 1st, 3rd, 4th. *Ohio*, at Westerville, 5th, 7th, 11th; at Urbana, $\frac{1}{2}$ in., 5th. *Utah*, at Coalville, 10th, 24th. *Vermont*, at Stafford, 18th; at West Charlotte, 20th.

Frosts on the nights of the 24th and 25th of March injured vegetation as follows: in Clark Co., Va., peaches, cherries and other early blossoming fruits nearly all destroyed; at Hagerstown, Md., cherries, peaches and early fruit somewhat injured. On April 20th peach blossoms were injured at Winnemucca, Nev.; April 18th flowers were killed on low ground at Kensico, N. Y.

PRECIPITATION.

On chart No. III is illustrated the general distribution of the rain-fall, which includes the melted snow, for the month. On the left side of the same chart will be found a table giving the average precipitation for April by districts. Deficiencies have occurred in the Middle Atlantic States, Ohio valley, and at Portland, Or. In the remaining sections the fall has been above the average, especially in the South Atlantic States, Minnesota and Dakota.

Special Heavy Rains:—2nd, Gulf Hammock, Levy Co., Fla., (1st to 3rd,) 4.75 in.; Mayport, Fla., (1st to 3rd,) 3.00 in.; St. Augustine, Fla., (1st to 3rd,) 4.64 in. 4th, Goldsboro, N. C., (3rd, 4th,) 2.07 in.; Cape Henry, 2.53 in.; Cape Hatteras, 2.05 in. 7th, Indianola, 2.73 in. 8th, Galveston, 3.27 in.; Vicksburg, 2.40 in.; near Brookhaven, Miss., 2.10 in.; near Fayette, Miss., 2.50 in.; Fort Barrancas, Fla., 2.75 in. 9th, Tybee Island, (8 a. m. to 10 p. m.,) 4.36 in.; Savannah, 3.52 in.; Charleston, 5.26 in.; Gulf Hammock, Fla., 2.00 in.; Highlands, N. C., 3.00 in.; Daytona, Fla., (9th, 10th,) 2.70 in. 10th, Goldsboro, N. C., (9th, 10th,) 2.25 in.; Lenoir, N. C., (9th, 10th,) 2.20 in.; Breckenridge, (10th, 11th,) 5.12 in.; Vevay, Ind., 2.80 in.; Cape Hatteras, 2.83 in. 11th, Greenville, N. C., 3.00 in. 14th, Fort Rice, Dak., (14th to 16th,) 3.94 in. 15th, near Quitman, Ga., (14th, 15th,) 2.60 in.; St. Mark's, 3.69 in.; Shreveport, 2.92 in. 17th, Bismarck, 2.35 in.; Deadwood, 3.20 in.; Fort Randall, Dak., (15th to 17th,) 2.35 in.; 18th, near Fayette, Miss., 2.30 in.; 19th, Memphis, (19th and 20th,) 3.59 in.; Mt. Sterling, Ill., (in two hours,) 3.00 in. 21st, Elmira, Ill., 2.40 in.; Neillsville, Wis., (21st and 22nd,) 2.30 in.; Manitowac, Wis., (21st and 22nd,) 2.18 in.; Deadwood, (21st and 22nd,) 2.26 in.; Wautoma, Wis., 3.00 in. 22nd, Anna, Ill., (22nd and 23rd,) 2.35 in.; Indianapolis, 2.04 in.; Empire City, Kan., 2.75 in.; Baxter Springs, Kan., 3.10 in.; Melissa, Tex., 2.00 in.; Mt. Ida, Ark., (22nd and 23rd,) 2.60 in. 23rd, Peoria, Ill., 1.98 in.; McMinnville, Tenn., 2.60 in.; St. Louis, (22nd and 23rd, in about five hours,) 3.75 in.; Memphis, 3.98 in.; Nashville, 2.95 in.; Vicksburg, 2.93 in.; Judsonia, Ark., 2.10 in.; Springfield, Mo., (22nd and 23rd,) 4.40 in.; Lebanon, Mo., (21st to 24th,) 4.49 in.; near Brookhaven, Miss., 2.35 in.; near Fayette, Miss., 2.70 in.; Macon, Miss., 2.25 in.; Ft. Barrancas, Fla., 3.48 in.; Green Springs, Ala., 2.50 in. 24th, Mobile, 2.13 in.; Montgomery, 2.17 in.; Grand Rapids, Mich., 2.61 in.; Martinsville, Ill., (22nd to 24th,) 5.78 in. 25th, Cape Henry, Va., 2.50 in. 26th, Milton, Mass., (25th and 26th,) 2.20 in. 27th, Mt. Washington, (25th to 29th,) 9.50 in.; Wolfboro, N. H., (26th and 27th,) 2.50 in. 28th, Rowe, Mass., (27th and 28th,) 2.35 in.;

Hennepin, Ill., 2.60 in.; Mystic, Conn., 2.10 in. 29th, Worcester, Mass., (28th to 30th,) 3.44 in.; Waltham, Mass., (29th and 30th,) 3.08 in.; Southington, Conn., 2.50 in. 30th, Lawrence, Mass., (29th and 30th,) 2.69 in.; Dunbarton, N. H., 2.34 inches.

Largest Monthly Rain-falls.—Mt. Washington, 23.41 inches; Memphis, 11.93 in.; Cape Henry, Va., 9.39 in.; Savannah, 9.08 in.; Kittyhawk, N. C., 8.95 in.; Deadwood, Dak., 8.77 in.; Dunbarton, N. H., 8.73 in.; Mt. Ida, Ark., and Mt. Sterling, Ill., 8.60 in.; Gulf Hammock, Levy Co., Fla., 8.85 in.; St. Marks, Fla., 7.65 in.; Vicksburg, 7.13 in.; Martinsville, Ill., 8.42 in.; Springfield, Mo., 7.85 in.; Breckenridge, Minn., 7.77 in.; Cape Hatteras, 7.38 in.

Smallest Monthly Rain-falls.—Kit Carson, Col., none; Umatilla, Or., 0.01 in.; Yuma, Cal., 0.02 in.; Denver, Col., 0.05 in.; Trinidad, Col., and Fort Davis, Tex., 0.09 in.; Fort Sanders, Wy. Ty., and Fort Richardson, Tex., 0.07 in.; Pilot Point, Tex., 0.11 in.; Edinburg, Tex., 0.13 in.; Sidney Barracks, Neb., 0.16 in.; Burkes, Arizona Ty., 0.17 in.; Cheyenne, Wy. Ty., 0.19 in.; Colorado Springs, Col., 0.20 in.

Floods.—16th and 17th, country covered with water in Suwanee Co., Fla., following heavy rains; corn and cotton seeds destroyed by rot. 21st, Deadwood, D. T., high water in rivers and creeks, damaging property; 26th, house washed away. 22nd and 23rd, St. Louis, heavy rain, cellars, &c., flooded; washout on Missouri Pacific R. R. 23rd, Memphis, heavy rain, bridges, culverts and railroad tracks swept away; all streams were bank full; the sawmills on Wolf river suffered considerably. Mobile, river rose, flooding wharves. 24th, Judsonia, Ark., river very high, slight overflows. 26th, Omaha, high water in Missouri river, (14 ft. 6 in.) water partly covered flats, and submerged about 20 yards of the B. and M. railroad track. In Merrimac and Hillsborough Co., N. H., as follows: 14th to 30th, Contoocookville, river and creeks very high, farming delayed by excessive rains, also injury to mills and railroads; 30th, Dunbarton, rivers very high; Nashua, Merrimac river still rising, (now 13 ft. above high water mark;) Nashua river very high; Souhegan river very high, flats at Danforth's Corners flooded. 30th, Sacramento, Cal., submerged portion of city now uncovered, river within its natural banks, gauge reading 19 ft. 9 in.; Washington also uncovered.

Droughts.—Crops were reported as suffering for want of rain on the 17th at Melissa, Tex.; 24th, Decatur, Tex.; 30th, in northern portion of Missouri.

High Tides.—3rd, Portsmouth, N. C., island partly submerged. 16th, Charleston, very high; Portsmouth, N. C., making roads impassable. 30th, Indianola.

Hail.—1st, Utah. 3rd, Iowa, Tenn. 4th, Kan. 6th, Pa., and at Greencastle 1 inch in diameter. 7th, Cal. 8th, Utah. 9th, Tenn.; Martinsville, Ind., 1 inch in diameter. 10th, Iowa, N. C. 11th, N. C., S. C., Va.; Fayetteville, N. C., size of partridge and hen's eggs, destroying fruit and vegetables, and killing poultry. 12th, N. Y. 13th, Ind. T., Wy. T., Iowa, Kan., Neb., British Col., Or.; Cottonwood Falls and Emporia, Kan., 2 to 3 inches in diameter, destroying considerable grain. 14th, Wy. T., Ark., Cal., Ill., Miss., Tex. 25th, Neb., Wy. T., Kan., Cal., British Col. 16th, Kan., Neb., Minn., Nev. 17th, Dak., Neb., Cal., Kan., Utah. 18th, Neb., Nev., Miss., Wis. 19th, Ill., Iowa, Mich., Tex., Minn., Pa. 20th, Cal., Dak., N. J., N. Y., Cal., Utah; near Northport, Mich., as large as hickory nuts, 18 inches deep at places. 21st, Ill., Iowa, N. C., Neb.; Osceola, Ill., ten inches in circumference. 22nd, Cal., Mo., N. Y., Ohio, Ind. Ty., Tex., Minn. 23rd, Ohio, Wy. Ty., Tex., Tenn.; at Fort Sill, Ind. Ty., ground covered, stones as large as walnuts. 24th, Ind., N. Y., N. C., Ohio, Pa. 25th, Ind., Ky., Ohio, Nev.; Louisville, Ky., considerable damage to fruit trees. 26th, Md., N. J., N. Y., N. C., Pa.; near Woodstock, Md., ground completely covered. 27th, Col., Md., Iowa, Mich., Y., Ohio, Pa., Va. 28th, Del., Md., N. Y., N. C., Ohio, Col., Tex., Va., Pa.; near Woodstock, Md., 6 inches deep on a level. 29th, Del., Mass., N. J., N. Y. 30th, Kan.; Creswell, Kan., 1 to 2 inches diameter.

Rainy Days.—The number of days on which rain or snow has fallen, varies as follows: New England, 15 to 23; Middle Atlantic States, 9 to 19; South Atlantic States, 7 to 14; Gulf States, 3 to 11; Ohio valley and Tennessee, 11 to 16; Lower Lake region, 13 to 17; Upper Lake region, 11 to 17; Upper Mississippi valley, 11 to 19; Lower Missouri valley, 8 to 13; at Bismarck and Deadwood, Dakota, 19; from western Kansas and Nebraska to Nevada and Idaho, 5 to 10; California, 4 to 10.

Cloudy Days.—For New England the number varies from 15 to 24; Middle Atlantic States, 6 to 18; South Atlantic States, 6 to 10; Gulf States, 2 to 13; western Texas, 2 to 9; Ohio valley and Tennessee, 6 to 17; Lower Lakes, 8 to 14; Upper Lakes, 7 to 15; Upper Mississippi valley, 5 to 17; Lower Missouri valley, 5 to 14; Minnesota and Dakota, 10 to 15; Rocky Mountain region, 3 to 11; California, 3 to 10.

Snow.—In northern New England it fell on the 1st, 2nd, 5th, 6th, 7th; western Virginia, 3rd, 5th; Upper Michigan, 5th; Minnesota, 8th, 10th, 11th; western Dakota, 9th to 22nd; western Nebraska, 8th to 18th; New Mexico, 17th, 22nd; Colorado, 8th, 9th; Wyoming, 7th to 9th, 12th to 22nd, 24th to 30th; Utah, 14th to 17th, 19th to 21st, 26th; Idaho, 12th, 13th, 20th; Nevada, 9th, 13th to 17th, 19th to 22nd, 26th; California, on mountains, 13th, 14th, 16th, 19th, 20th.

Depth of Snow at Close of Month.—The following are the only stations reporting snow: Los Angeles, Cal., visible on mountains; summit of Pike's Peak, 24 inches in depth.

RELATIVE HUMIDITY.

The average percentage of humidity for the month ranges as follows: New England, from 66 at Springfield to 80 at Thatcher's Island; Middle Atlantic States, 56 at Lynchburg to 81 at Atlantic City; South Atlantic States, 64 at Augusta to 77 at Cape Lookout; Gulf States, 62 at Corsicana to 63 at Montgomery and 77 at Galveston; Ohio valley and Tennessee, 56 at Louisville to 64 at Memphis; Lake region, 63 at Toledo to 78 at Buffalo and Milwaukee; Upper Mississippi and Lower Missouri valleys, 56 at St. Louis to 69 at Keokuk; Minnesota and Dakota, 62 at Bismarck to 71 at Breckenridge; Rocky Mt. region, 33 at Denver to 52 at Boise City, Idaho, and 67 at Pioche, Nev.; California, 59 at Red Bluff to 70 at San Francisco. The percentage at high stations averages 66 for Pike's Peak and 92 for Mt. Washington.

WINDS.

The prevailing winds at the Signal Service stations are shown by the arrows, flying with the wind, on chart No. II. The *maximum* velocities, in miles per hour, have been given in the description of the movements of low pressure-areas. On Mt. Washington the highest velocity, 102 miles, occurred on the 21st.

Total Movements of the Air.—The following are the *largest* monthly movements, as recorded at the Signal Service stations, viz: Pike's Peak, 15,086 miles; North Platte, 12,203; Cape Lookout, 12,046; Umatilla, Or., 11,706; Bismarck, 10,862; Cape May, 10,748; Cape Hatteras, 10,744; Breckenridge, 10,620; Dodge City, 10,489; Indianola, 9,853; Sandy Hook, 9,353; Milwaukee, 9,308; Sandusky, 9,299; Barnegat, 9,072. The *smallest* are: Deadwood, D. T., 1,486 miles; Visalia, Cal., 1,665; San Antonio, 1,973; Knoxville, 2,549; Augusta, 2,744; Shreveport, 3,015; Brackettville, Tex., 3,081; Lynchburg, 3,115; Springfield, Mass., 3,232; Boise City, Idaho, 3,496.

VERIFICATIONS.

Indications.—As worked up and issued to the public three times daily, they have been carefully compared with the actual conditions during the succeeding twenty-four hours with the following result, viz: the percentage verified averages 81.8 for New England; 80.5 for the Middle Atlantic States; 79.6 for the South Atlantic States; 76.7 for the East Gulf States; 78.7 for the West Gulf States; 77.4 for the Ohio valley and Tennessee; 80.1 for the Lower Lake region; 78.8 for the Upper Lake region; 77.1 for the Upper Mississippi valley; 76.0 for the Lower Missouri valley. For all the districts the average verified is 78.7 per cent. By elements the percentage verified averages 85.9 for the weather; 81.3 for the wind direction; 74.1 for temperature; 73.5 for the barometer. There were 17 omissions to predict, (5 for weather, 2 for wind direction, 7 for temperature and 3 for barometer,) out of 3,600, or 0.47 per cent. Of the 3,583 predictions that have been made, 219, or 6.1 per cent, are recorded as having completely failed; 176, or 4.9 per cent, as one-fourth verified; 536, or 15.0 per cent, as one-half verified; 576, or 16.1 per cent, as three-fourths verified; 2,076, or 57.9 per cent, as fully verified.

Cautionary Signals.—Out of 191 signals ordered to be displayed, 117, or 61.2 per cent, were justified by subsequent hourly velocities of 25 miles and over at or within 100 miles of the station, but of these 20 were somewhat late, and 16 were ordered down too soon; 74 were not justified.

NAVIGATION.

Stages of Water in Rivers.—In the table on the right side of chart No. III are given the highest and lowest readings of the Signal Service river-gauges for the month, with the dates. At no point was the "danger line" reached during the month.

Opening of Navigation.—*Upper Missouri*, steamer "Big Horn" made the first trip of season from below, passed Lower Brule Agency on the 1st, arrived at Fort Lincoln the 9th and Bismarck the 10th, left Bismarck on the 12th, and reached Fort Benton, M. T., on the 30th; reported river in good condition, and rising rapidly; this is the earliest trip on record. *Lakes*, 4th, Duluth, first large steamer left for lower ports; Charlotte, Lake Ontario, first boat arrived. 6th, Rochester, Canadian steamers commenced running. 7th, Northport, Mich., steamers arrived. 10th, Milwaukee, first arrival from Lower Lakes. 12th, Duluth, Minn., two Canadian steamers arrived, first of season and earliest on record. Marquette, navigation opened by arrival of steam barges, reporting water in Sault St. Marie Canal one foot lower than last year; depth at entrance of basin 11 feet 3 inches. In northern portion of *New England*.—2nd, Bangor, Me., ice passed out of Penobscot river; navigation resumed after 93 days of ice. 14th, Sebago Lake, Me., clear. 13th, Winnepiscogee Lake, N. H., clear of ice; one month earlier than usual. *Red River*, at Shreveport, navigation good throughout month, but upper river falling and navigation almost suspended on the 30th.

Canal Navigation.—1st, north branch of Pennsylvania canal opened. 9th, Delaware and Hudson canal opened. 15th, Erie and Oswego canal opened.

ATMOSPHERIC ELECTRICITY.

Thunder-storms.—1st, Fla., Ga., Neb. 2nd, Fla. 3rd, Fla., Ga., Mo., Ala., N. C., Tenn. 4th, Fla., N. C. 6th, Dak., N. J., Ohio, Pa. 7th, Ill., Iowa, Kan., Mo., Neb., Tex. 8th, Dak., Kan., Fla., Ga., Ill., La., Miss., Mo., Ala., Tenn. 9th, Fla., Ill., Ind., Iowa, Ohio, Tenn., Ky., S. C., Ga. 10th, Cal., Ind., Ky., Mo., N. C., Ohio, Tex., W. Va., Tenn., Pa., Me. 11th, Va., Del., Mass., N. C., Pa., S. C., Ga., N. Y. 12th, Conn., N. J., N. Y., Ind., Pa., Vt., Va. 13th, Dak., Ind. T., Kan., Ill., Ind., Iowa, Mo., Neb., Ohio, Va. 14th, Dak., Ark., Fla., Ga., Ill., Ind., Iowa, Mich., Miss., Mo., Ind. Ty., Ala., Tenn. 15th, Fla., Ill., Ind., Iowa, Ky., Mass., Mo., Neb., N. C., Tex., La., Ga., Ala., S. C., Tenn., Va. 16th, Dak., Ind. Ty., Kan., Fla., Ill., Iowa, Mo., Neb. 17th, Dak., Kan., Iowa, La., Mo., Neb., N. J., Ind. Ty., Ala. 18th, Ind., Ill., Iowa, La., Miss., Mo., Minn. 19th, Ill., Ind., Iowa, Kan., La., Mich., Mo., Ohio, Pa., Tex., Wis., Minn., Or., Tenn. 20th, Dak., N. Y., Del., Ga., Ill., Me., Md., N. J., Ohio, Pa., Cal., Neb., Tex., W. Va., Tenn., Va., Vt. 21st, Dak., Kan., Ill., Ind., Iowa, Mo., Mass., Neb., N. H., N. J., N. Y., Cal., Minn., Wis., Tenn., Pa. 22nd, Ind. Ter., Mich., N. Y., Ohio, Ill., Ind., Iowa, Kan., La., Md., Mass., Miss., Mo. Ohio, Tex., Ala., Wis., Pa., W. Va., Ky. 23rd, N. Y., Tex., Ark., Fla., Ill., Ind., Iowa, La., Md., Mich. Miss., Mo., N. J., Ohio, Pa., Ala., Wis., Tenn. 24th, Fla., Ga., Ind., Md., Mich., N. J., N. Y., N. C., Ohio, W. Va., Va., Pa., S. C., Tenn. 25th, R. I., Conn., Ind., Ky., Md., Miss., Mo., N. C., Ohio, Nev., Va. 26th, N. Y., Va., Del., Ga., Md., Mass., N. J., N. C., Pa. 27th, Col., Md., N. Y., Va., Mich., Ohio, Pa., Tex., Ala., Wis. 28th, Md., Del., N. J., N. Y., N. C., Ohio, Pa., Kan., Tex., Ala., Va. 29th, Dak., Mass., Minn. N. Y., R. I., Conn., Del., N. J., Pa., Md. 30th, Iowa, Kan., Mass., Mo., Neb.

Auroras.—Vevay, Ind., 2nd; Iowa City, Iowa, 5th; Monticello, Iowa, 26th; North Argyle, N. Y., 2nd Escanaba, Mich., 3rd; Morgantown, W. Va., 24th; Indianapolis, Ind., 28th; Burlington, Iowa, 19th; Wood's Holl, Mass., 18th; Bangor, Me., 19th; Starkey, N. Y., 14th, 30th; Wappinger's Falls, N. Y., 8th; Wytheville, Va., 27th, 29th, 30th.

Magnetic Phenomena.—Prof. G. Hinrichs, Iowa City, Iowa, reports the average diurnal magnetic range in declination as 8.2 minutes.

Telegraphic Communication interfered with by Atmospheric Electricity.—Visalia, Cal., 3rd, 2 p. m., wires surcharged with electricity. Pike's Peak, 10th, 13th and 22nd, intense electricity, could not transmit reports; 22nd, incessant crackle at lightning arrester; 27th, intense electricity. Concho, Tex., 19th, communication interrupted during thunder-storm; 28th, atmosphere greatly charged with electricity. Mason, Tex., 7th, storm interfered with communication. New London, 29th, air highly charged with electricity, interfering with telegraph wires.

OPTICAL PHENOMENA.

Solar Halos.—1st, Miss., Ohio, Ky. 2nd, Cal., Tex., Ala., Ky. 3rd, Ill., Ind., Mich., Ohio. 4th, Iowa, Mass., N. Y., Ohio, R. I. 5th, Del., Ga., Ill., Ind., Iowa, Mich., N. Y., Ohio, Ky. 6th, Iowa, Conn. 7th, Mich., Ohio. 8th, Pa., N. H. 9th, Miss., N. Y., Ohio, R. I., Conn., Mass. 11th, Ill., Ind., Mich., Pa., Ohio, Neb. 12th, Conn., N. Y., Ohio. 13th, Ill., Ind., Iowa, Ohio, Pa., W. Va., Ky. 14th, Mich., Pa., Vt., Cal., Ohio, Ga., Neb. 15th, Conn., N. J., N. Y., Ohio. 16th, Mich., N. H., Ohio, R. I., Mass., Conn., Tex. 17th, Ill., Ind., Mich., Ohio, Me. 18th, Mass., N. Y., Mich., Ohio, Ky., Vt. 19th, Ohio, Ga., Va., N. Y., Conn. 20th, Conn., Me., Mass., N. H., N. Y., Ohio, Vt., S. C. 21st, Mich., N. H., Ky. 22nd, Conn., Iowa, Me., Mass., Neb., N. H., N. Y., Ohio, Vt., S. C., R. I. 23rd, Me., N. Y., Ohio, Ga. 24th, Col. 25th, Mich., Conn. 26th, Ohio, La. 27th, N. Y., Kan., Tex., Vt. 28th, Neb. 29th, Mich., Utah, Cal., Fla., Conn. 30th, Ill., Iowa, Mich., and Conn.

Lunar Halos.—5th, Iowa. 7th, Mich., Utah, Va., Neb., S. C., Ga., Vt. 8th, N. Y., Mich., Md. 9th, Me., Va., Kan., Mo., W. Va., R. I. 10th, Ill., Mo., Wy. T., Neb., Iowa. 11th, Ill., Kan., Md., Mich., Ohio, Texas, Minn., Pa., Ky., S. C. 12th, Mass., Mich., Wis., Dak., Mo., Ohio, N. Y., R. I., Neb. 13th, Del., Me., Mich., Ohio, Va., Wis., Mo., W. Va., Ky. 14th, Mich., Va., N. Y., Ky., Fla. 15th, Ill., N. J., N. Y., Mo., Minn., S. C., Pa., N. H., Texas. 16th, Ind., Iowa, Mich., Ala. 17th, Ill., Mich., N. J., Ohio, Va., Me. 18th, S. C., Mass. 19th, Mass. 22nd, N. Y. 25th, Wis. 29th, S. C. 30th, S. C.

Mirage.—Olivet, Dak., 2nd, 3rd, 28th, 29th, 30th; Iowa City, Iowa, 22nd; New London, Conn., 15th; Starkey, N. Y., 21st.

MISCELLANEOUS PHENOMENA.

BOTANICAL.—Maine—in bloom, 26th, wild strawberry; leafing, 16th, raspberry, lilac, 18th, red maple, 24th, poplar. New Hampshire.—in bloom, 14th, trailing arbutus, 16th, elm; 30th, apple: leafing, 20th, red maple, lilac, goose-berry; 30th, maple, elm, birch; 30th, fruit forward. Vermont—in bloom, 4th, 11th, may flowers; 30th, plum, strawberry; budding, 28th, maple; 30th, grass four inches high. Massachusetts—in bloom, 1st, willow; 2nd, trailing arbutus; 5th, cinque foil; 6th, maple, hazel; 10th, lilac, elm; 13th, willow; 3rd, dandelion; 14th, alder, poplar, fever bush; 8th, violet; 11th, hyacinth; 18th, forsythia; 19th, mag-

nolia, larch; 17th, anemone, addertongue; 20th, cowslip; 23rd, cherry; 25th, plum; 22nd, horsechestnut; 28th, hawthorn; 21st, peach: ripe, 23th, rhubarb: leafing, 4th, gooseberry; 6th, currant; 24th, garden peas two inches high. Connecticut—in bloom, 8th, red maple, peach; 21st, shad bush; 24th, cherry; 27th, pear; 28th, apple; 17th, violet, jonquil: leafing, 10th, syringa; 27th, apple; 15th, rose; 22nd, horsechestnut, pear. New York—in bloom, 4th, daffodil; 12th, maple; 14th, dandelion, trailing arbutus; 18th, cherry; 21st, peach, plum; 30th, flowering almond, strawberry, blackalder; 29th, apple, pear; 18th, magnolia; 27th, lilac; 23rd, currant, shad-bush; 7th, violet, hyacinth; 15th, crocus, snow-drop; 17th, apricot: leafing, 1st, lilac; 30th, locust; 24th, forest-trees: 29th, rye heading, grain in fine condition; 24th, wheat unusually forward. New Jersey—in bloom, 11th, strawberry, pear, maple; 12th, cherry, peach; 14th, plum; 24th, lilac, apple, dogwood, grape: leafing, 25th, forest-trees. Maryland—in bloom, 27th, pea; 27th to 30th, wheat heading out. Pennsylvania—in bloom, 10th to 19th, peach; 14th, cherry, plum; 16th, grape; 19th, apple, pear: leafing, 20th, forest-trees: 20th to 24th, rye heading; 30th, wheat heading. West Virginia—in bloom, 5th, cherry, 10th apple, plum; 15th, wheat looks well. Virginia—in bloom, 3rd, dogwood, sassafras; 10th, poplar, maple, apple, pear, judas tree; 13th, cherry; 15th, lilac; 19th, fruit formed on all trees, except apple, in the eastern portion of State; in the northwestern portion, cherries formed on the 28th. North Carolina—ripe, 30th, strawberry. Florida—ripe, 23rd, strawberry, plum and dewberry; 1st, blackberry ripening, 15th plentiful. Mississippi—in bloom, 20th, snap dragon; 22nd, gladiola, morning glory; 27th, carolina pink, wild rose, larkspur, moss rose, portulacca; 27th, oats in full head. Arkansas—in bloom, 1st, white oak; 2nd, blackberry: ripe, 1st, maple seed; 11th, strawberry; 24th, cherry. Missouri—in bloom, 2nd, black-locust; 3rd, violet; 4th, crap-apple; 5th, cherry; 6th, apple; 7th, dandelion; 8th, strawberry; 11th, lilac; 16th, tulip; 18th, larkspur; 19th, snow-ball; 20th, honey-suckle, horse-radish; 27th, white walnut; 26th, yellow rose; 29th, pea; 22nd, blackberry; 26th, potatoe; ripe, 22nd, maple seed; leafing, 5th, maple; 17th, bluegrass heading; 20th, wheat in full head, prospects good. Indian Territory—in bloom, 17th, locust: ripe, 29th, strawberry. Ohio—in bloom, 1st, 11th, 13th, 15th, 17th, peach; 24th, apple, lilac; 4th, pear; 18th, cherry, plum, flowering almond, maple; 21st, redbud; 11th, magnolia, 27th, honey-suckle; 20th, dogwood; 25th, quince; 6th, currant, gooseberry: leafing, 20th to 28th, trees generally; 30th, barley heading; 17th, wheat and tobacco very forward. Indiana—in bloom, 1st, apricot, violet, hyacinth, crocus, narcissus, galanthus, anemone; 3rd, red bud jonquil, flowering almond, wild plum; 8th, cherry, pear; 10th, plum, peach; 15th, pear, cherry, tulip, iris; 17th, apple; 20th, dogwood; 22nd, rose; 23rd, wheat heading. Illinois—in bloom, 3rd, dandelion, pear; elm; 4th, buttercup; 5th, cherry, crab-apple, strawberry, blackberry; 7th, lilac; 15th, apple; 18th, plum; 21st, snow-ball; 22nd, roses, may apple, geranium; 24th, prairie candle-stick; 26th, actea; budding, 5th, grape vine; leafing, 21st, grape vine. Michigan—in bloom, 6th, daffodil; 29th, shad bush; 30th, peach, apple; leafing, 29th, forest trees. Iowa—in bloom 5th, dandelion; 6th, apple, pear, gooseberry; 7th, cherry, plum; 8th, peach; 20th, lilac, jessamine; 23rd, judas tree; 24th, strawberry, currant; 27th, hawthorn; 30th, pea: leafing, 11th, black walnut; 27th, crab apple; ripe, 30th, white maple seed. Wisconsin—in bloom, 19th, plum; 20th, bloodroot, violet, liverwort; 21st, dandelion, clover; 29th, strawberry; 30th, cherry, mountain ash, horsechestnut; 11th, blue iris; 22nd, apple: leafing, 29th, willow, balm of gilead; 30th, currant nearly full bloom. Kansas—in bloom, 5th, crabapple; 7th, apple; 3rd, plum; 4th, cherry, pear; 6th, flowering almond; 10th, rose; ripe, 8th, elm and maple seeds. Nebraska—in bloom, 8th, crabapple, plum; 11th, flowering almond, apple, cherry; 13th, strawberry; 2nd, wild flowers; 20th, wild cherry and plum; 9th trees leafing. Dakota—Olivet, 1st, grass commencing to look green; 15th sufficient growth for stock; prairies mostly green; 20th, cottonwood leafing. Nevada—in bloom, 2nd, peach; leafing, 29th, poplar, cottonwood. California—Visalia, 12th, barley and wheat heading.

BIRDS.—*Wild Geese*: Mount Sterling, Ill., 2d, 17th; Creswell, Kan., 6th, 10th, 11th, 12th; New Bedford, Mass., 7th; Springfield, Mass., 8th; Rowe, Mass., 9th; Contoocookville, N. H., 4th; Flushing, N. J., 25th; Green Castle, Pa., 22d; Woodstock, Vt., 6th; Newport, Vt., 10th; Embarrass, Wis., 19th; Bismarck, Dak., 11th, 25th; Dubuque, Iowa, 30th; Newport, R. I., 7th; Fort Griffin, Tex., 5th. *Martins*: Monticello, Iowa, 10th; Afton, Iowa, 8th; Cornish, Me., 15th; Fallston, Md., 9th; Plattsmouth, Neb., 10th; Oregon, Mo., 9th; Palermo, N. Y., 4th; Weldon, N. C., 12th, 23rd; Bellefontaine, Ohio, 6th; Jacksonburg, Ohio, 11th; Lewisburg, Ohio, 8th; Catawissa, Pa., 1st; Newport, Vt., 20th; Embarrass, Wis., 14th. *Swallows*: Southington, Conn., 25th to 29th; New Corydon, Ind., 18th; Guttenburg, Iowa, 13th; Cornish, Me., 15th; West Waterville, Me., 24th; Somerset, Mass., 2d; New Bedford, Mass., 3d; Litchfield, Mich., 20th; Waltham, Mass., 22d; Palermo, N. Y., 20th; Contoocookville, N. H., 14th; Pleasant Run, N. J., 22d; Wap-pinger's Falls, N. Y., 16th; Flushing, N. Y., 14th; Bellefontaine, Ohio, 19th; Sandusky, Ohio, 10th; Jacksonburg, Ohio, 11th, 15th; Bethel, Ohio, 23d; Catawissa, Pa., 10th; Chambersburg, Pa., 12th; West Charlotte, Vt., 17th; Woodstock, Vt., 30th; Strafford, Vt., 22d; Wytheville, Va., 15th; Prospect Hill, Va., 13th; Morgantown, W. Va., 13th; Atlantic City, N. J., 2d; Fort Union, N. M., 24th; Waterburg, N. Y., 26th. *Whippoorwills*: Laconia, Ind., 9th; Holton, Kan., 14th; Fort Madison, Iowa, 18th; St. Meinrad, Ind., 14th; Guttenburg, Iowa, 18th; Cresco, Iowa, 23d; Okalooska, La., 12th; Fallston, Md., 14th; Plattsmouth, Neb., 18th; Fayette, Miss., 1st; Oregon, Mo., 27th; Palermo, N. Y., 23d; Kensico, N. Y.,

20th; Weldon, N. C., 22nd; Murphy, N. C., 3rd; Ringgold, Ohio, 17th; near Keswick Station, Va., 10th; Dover Mines, Va., 10th. *Wrens*: Monticello, Ia., 10th; Plattsmouth, Neb., 18th; Oregon, Mo., 27th; Palermo, N. Y., 30th. *Cranes*: Monticello, Iowa, 20th; Creswell, Kan., 18th; Oregon, Mo., 16th; Dover Mines, Va., 10th; Fort Griffin, Tex., 4th; Camp Sheridan, Neb., 4th. *Cat-bird*: Tabor, Iowa, 23rd; Somerset, Mass., 20th; Plattsmouth, Neb., 18th; Murphy, N. C., 10th; Sandusky, Ohio, 30th; Jacksonburg, Ohio, 28th; Fayetteville, N. C., 1st; Bethel, Ohio, 22nd; Prospect Hill, Va., 23rd. *Mocking birds*: Baxter Springs, Kan., 15th; Fort Madison, Iowa, 18th; Brookhaven, Miss., 6th; Oregon, Mo., 6th. *Phebes*: Woodstock, Vt., 9th; *King birds*: Baxter Springs, Kan., 16th; Fayetteville, N. C., 1st; Prospect Hill, Va., 29th. *Cuckoos*: Brookhaven, Miss., 24th; Fayette, Miss., 16th. *Prairie chickens*: Fayette, Miss., 18th. *Thrush*: Southington, Conn., 21st; Baxter Springs, Kan., 14th; Somerset, Mass., 8th, 19th; Litchfield, Mich., 20th; Jacksonburg, Ohio, 16th; Woodstock, Vt., 25th. *Humming birds*: Laconia, Ind., 13th; Fayetteville, N. C., 14th. *Kingfishers*: West Charlotte, Vt., 17th. *Blackbirds*: Cornish, Me., 19th; Woodstock, Vt., 26th; Coalville, Utah, 27th. *Quail*: Brookhaven, Miss., 16th. *Bluejays*: Creswell, Kan., 29th. *Killdeer*: Starkey, N. Y., 2nd. *Snipe*: Creswell, Kan., 20th; Litchfield, Mich., 20th. *Pelicans*: Corning, Me., 15th, in large flocks. *Yellow Birds*: Palermo, N. Y., 23rd; Woodstock, Vt., 15th. *Meadow Larks*: Palermo, N. Y., 3rd; Embarrass, Wis., 1st. *Grouse*: Cornish, Me., 11th. *Ducks*: Nashville, Tenn., 19th. *Woodpeckers*: Cornish, Me., 2nd; Brookhaven, Miss., 4th; Woodstock, Vt., 25th. *Orioles*: Ft. Madison, Iowa, 28th; Cornish, Me., 15th; Litchfield, Mich., 30th; Plattsmouth, Neb., 22nd; Oregon, Mo., 27th. *Brants*: Ft. Madison, Iowa, 28th.

MISCELLANEOUS.—*Frogs piping*: Weyay, Ind., 2nd; Monticello, Iowa, 29th; Cornish, Me., 5th; Standish, Me., 3d; Fall River, Mass., 4th; Palermo, N. Y., 24th; Contoocookville, N. H., 3d; Woodstock Vt., 11th; Newport, Vt., 18th; Embarrass, Wis., 1st; Dubuque, Iowa, 11th; Camp Sheridan, Neb., 4th. *Colorado potato bug*: Laconia, Ind., 18th, numerous; New Market, Md., 29th, in large numbers; Litchfield, Mich., 30th, numerous; Vineland, N. J., 30th, in large numbers; Chambersburgh, Pa., 30th, very abundant; Olivet, Dak., 16th. *Fire-flies*: St. Meinrad, Ind., 16th; New Orleans, La., 6th. *Millers*: Creswell, Kan., 6th. *Bees*: Standish, Me., 10th; Oregon, Mo., 6th; West Charlotte, Vt., 19th; Embarrass, Wis., 29th; Waterburg, N. Y., 26th. *Bats*: Freehold, N. J., 20th; Catawissa, Pa., 22nd. *Butterflies*: Somerset, Mass., 7th; New Bedford, Mass., 14th; Catawissa, Pa., 23rd; West Charlotte, Vt., 29th. *Wasps*: Oregon, Mo., 7th. *Lady-bugs*: Oregon, Mo., 17th. *Crickets*: Oregon, Mo., 19th. *June-bugs*: Palermo, N. Y., 30th. *Mosquitoes*: Olivet, Dak., 3rd, 11th. *Shad*: first caught on the 3rd at Wappinger's Falls, N. Y.; 4th, Ardenia, N. Y. Flushing, L. I., fishing better than for 30 years past.

Meteors.—Visalia, Cal., 30th; Judsonia, Ark., 11th; Southington, Conn., 18th; Woodstock, Md., 1st, 2nd, 5th, 25th and 26th; Milton, Mass., 29th; Fall River, Mass., 3rd; Litchfield, Mass., 20th; Oregon, Mo., 3rd; Waterburg, N. Y., 19th and 20th; North Volney, N. Y., 20th; Wappinger's Falls, N. Y., 3rd; Westerville, Ohio, 15th; Green Castle, Pa., 7th. Port Jarvis, N. Y., 16th, 12:10 a. m., a large meteor of intense brilliancy passed from S. to N., altitude 45°, bursting when near northern horizon, with a report resembling heavy thunder heard after an interval of nearly two minutes; sky somewhat cloudy.

Polar Bands.—Baltimore, Md., 8th; New Corydon, Ind., 1st, 3rd, 4th, 7th; Guttenburg, Ia., 12th; Iowa City, Ia., 17th; Tabor, Ia., 17th; Gardiner, Me., 3rd; Plattsmouth, Neb., 20th; North Argyle, N. Y., 4th; Vineland, N. J., 22nd; Wytheville, Va., 1st, 17th.

Prairie and Forest Fires.—In Kansas every day, except 7th, 9th and 17th. Missouri, 1st, 4th, 5th, 19th, 23rd, 28th. Dakota, 2nd to 4th, 6th, 12th, 13th, 24th, 28th to 30th. Iowa, 4th. Nebraska, 5th, 24th, 26th. New Jersey, 21st. New York, 12th, 13th.

Zodiacal Light.—Southington, Conn., 3rd, 18th, 21st; Cresco, Iowa, 22nd, 27th; Monticello, Iowa, 5th, 6th, 18th, 19th, 20th, 23rd, 26th, 27th, 28th, 29th, 30th; Somerset, Mass., 3rd, 18th, 19th, 20th, 21st; Fall River, Mass., 21st; Rowe, Mass., 2nd; Cambridge, Mass., 3rd, 17th, 18th, 19th, 21st; Corning, Mo., 19th, 24th, 26th, 27th; Atco, N. J., 1st, 2nd, 21st, 26th, 30th; Tybee Island, Ga., 1st; Waterburg, N. Y., 2nd, 19th, 20th, 21st; Bellefontaine, Ohio, 4th; Wytheville, Va., 4th.

Earthquake.—On the 15th, at Glendale, Montana, on the Yellowstone, three distinct shocks were felt, following each other at intervals of half an hour. A rent in the ground was reported, five hundred yards long, revealing a coal vein, and emitting a strong odor of sulphur.

Sunspots.—The following observations, made by Mr. D. P. Todd, have been forwarded by Rear Admiral John Rodgers, U. S. Navy, superintendent of the U. S. Naval Observatory, Washington, D. C., viz:—none visible on the 1st, 6th, 7th, 8th, 11th, 12th, 13th, 14th, 17th, 18th, 19th, 21st, 22nd, 23rd, 25th, 26th, 29th and 30th; new, one group and one spot, the 2nd; large group of faculae visible the 5th and 27th.

Prof. G. Hinrichs, Iowa City, Ia., reports having examined the sun's disk on sixteen days, but without seeing any spots.

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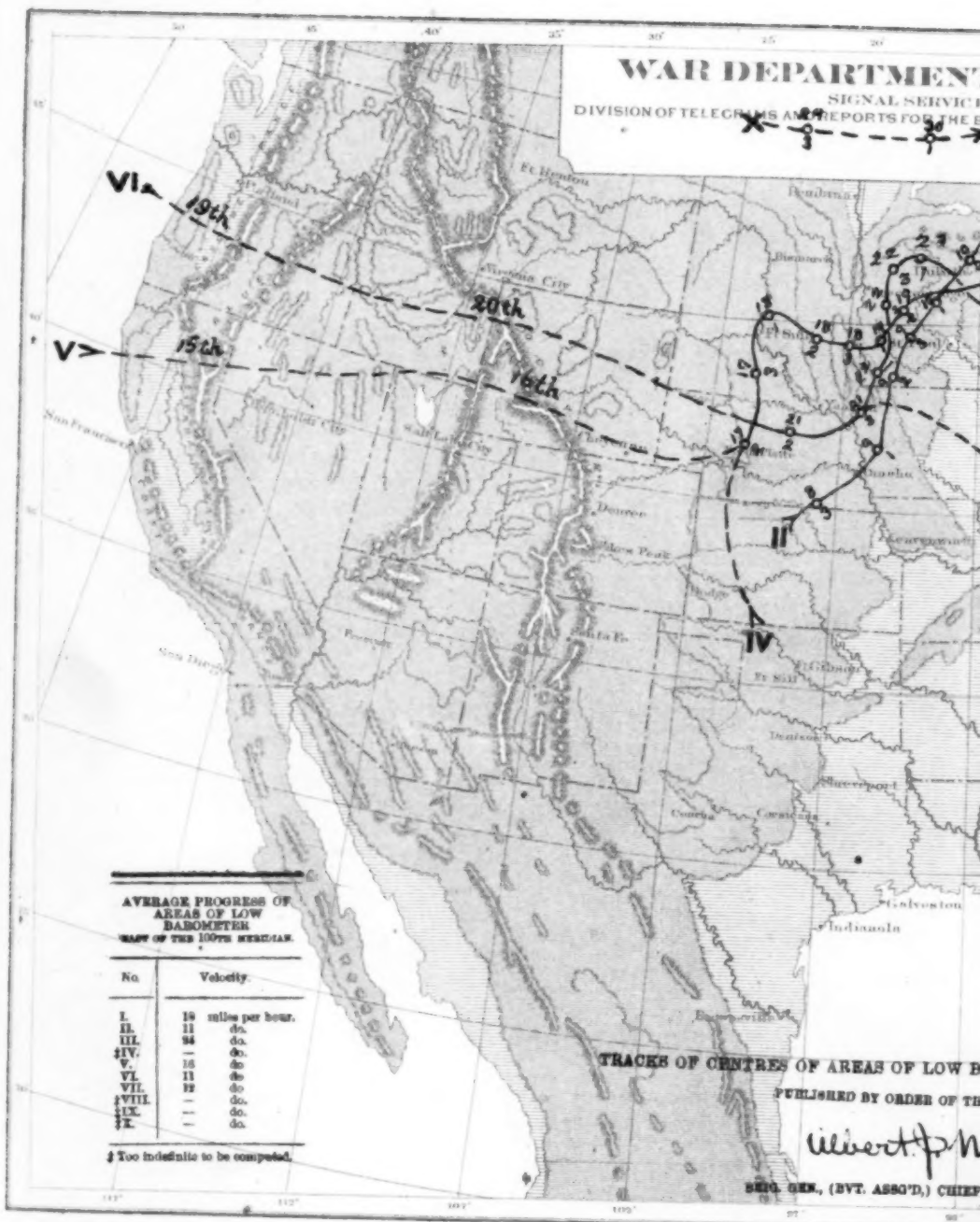
Albert J. Myer

Brig. Gen. (Bvt. Assg^d.) Chief Signal Officer, U. S. A.

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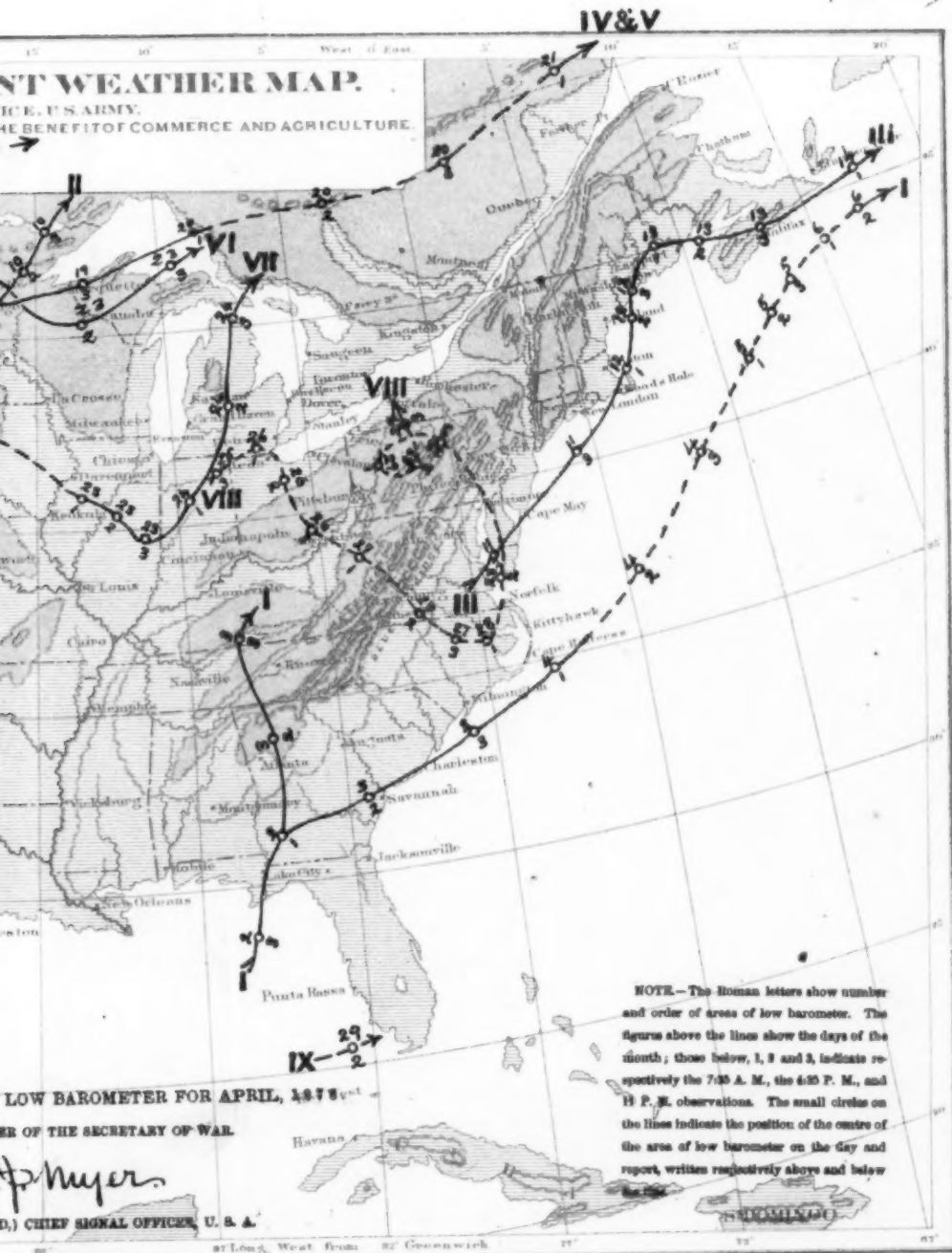
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DIVISION OF TELEGRAMS AND REPORTS FOR THE E



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ST WEATHER MAP.

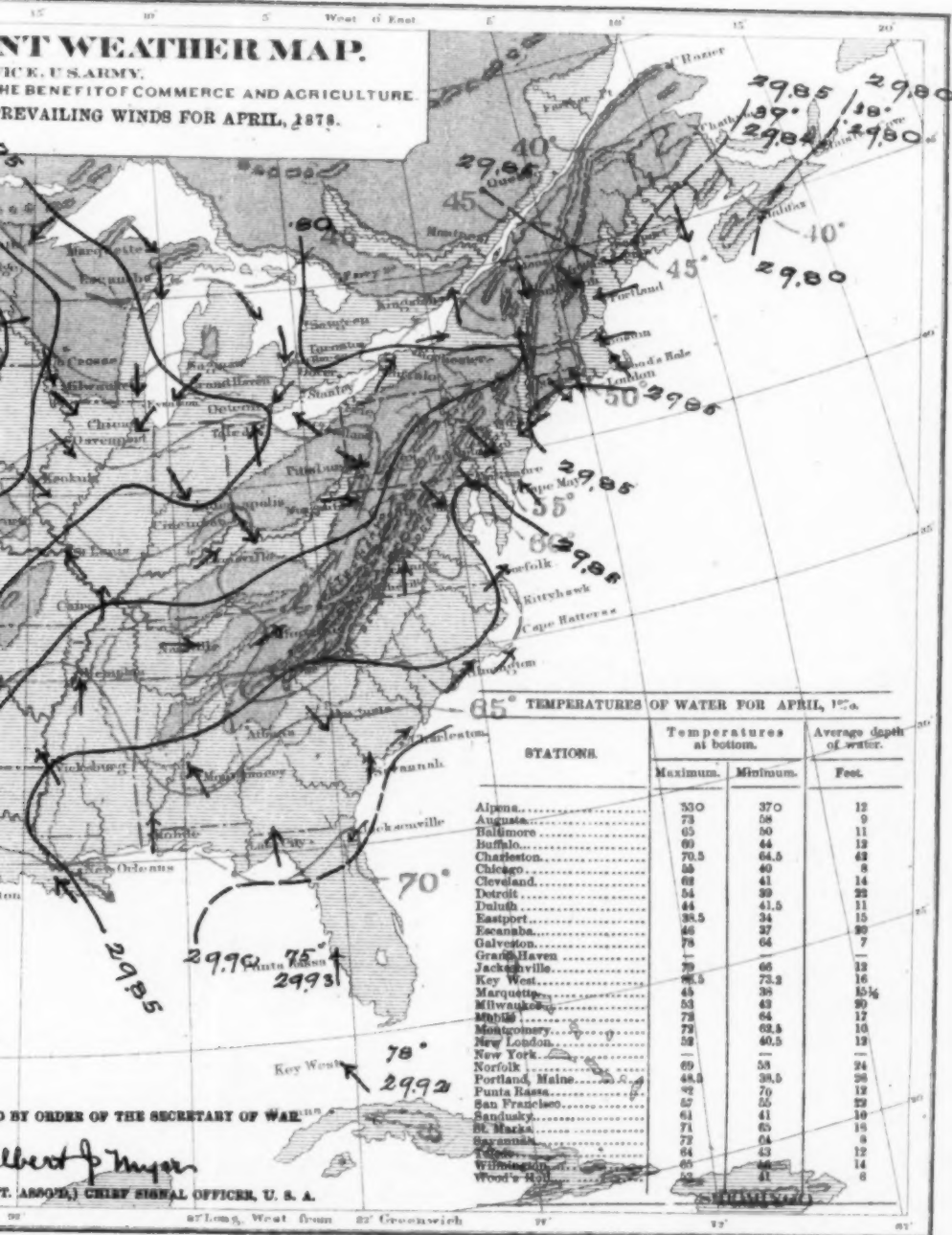
FOR THE U. S. ARMY.
FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.



AVERAGE TEMPERATURES FOR APRIL.			
DISTRICTS.	Average for April. Signal Service Observations.		Comparison with 1890, viz., average for several years.
	For several years.	For 1890.	
St. Lawrence valley.....	38°·7	46°·8	7°·8 above.
New England.....	41·3	49·3	8°·0 above.
Middle Atlantic States.....	50·6	57·5	6°·9 above.
South Atlantic States.....	65·0	67·8	2°·8 above.
Gulf States.....	66·5	70·0	3°·5 above.
Ohio valley and Tennessee.....	54·6	61·4	6°·8 above.
Lower Lake region.....	41·0	51·8	10°·8 above.
Upper Lake region.....	37·4	47·9	10°·5 above.
Upper Mississippi valley.....	47·4	55·6	8°·2 above.
Lower Missouri valley.....	50·7	58·5	7°·8 above.
Upper Missouri valley.....	49·0	49·8	0°·8 above.
Minnesota.....	47·4	51·1	3°·7 above.
Rocky Mountains stations.....	35·8	39·1	3°·3 above.
Pacific Coast.....	54·6	59·1	4°·5 above.

ANT WEATHER MAP.

ICK, U.S. ARMY.
HE BENEFIT OF COMMERCE AND AGRICULTURE.
REVAILING WINDS FOR APRIL, 1878.



BY ORDER OF THE SECRETARY OF WAR.

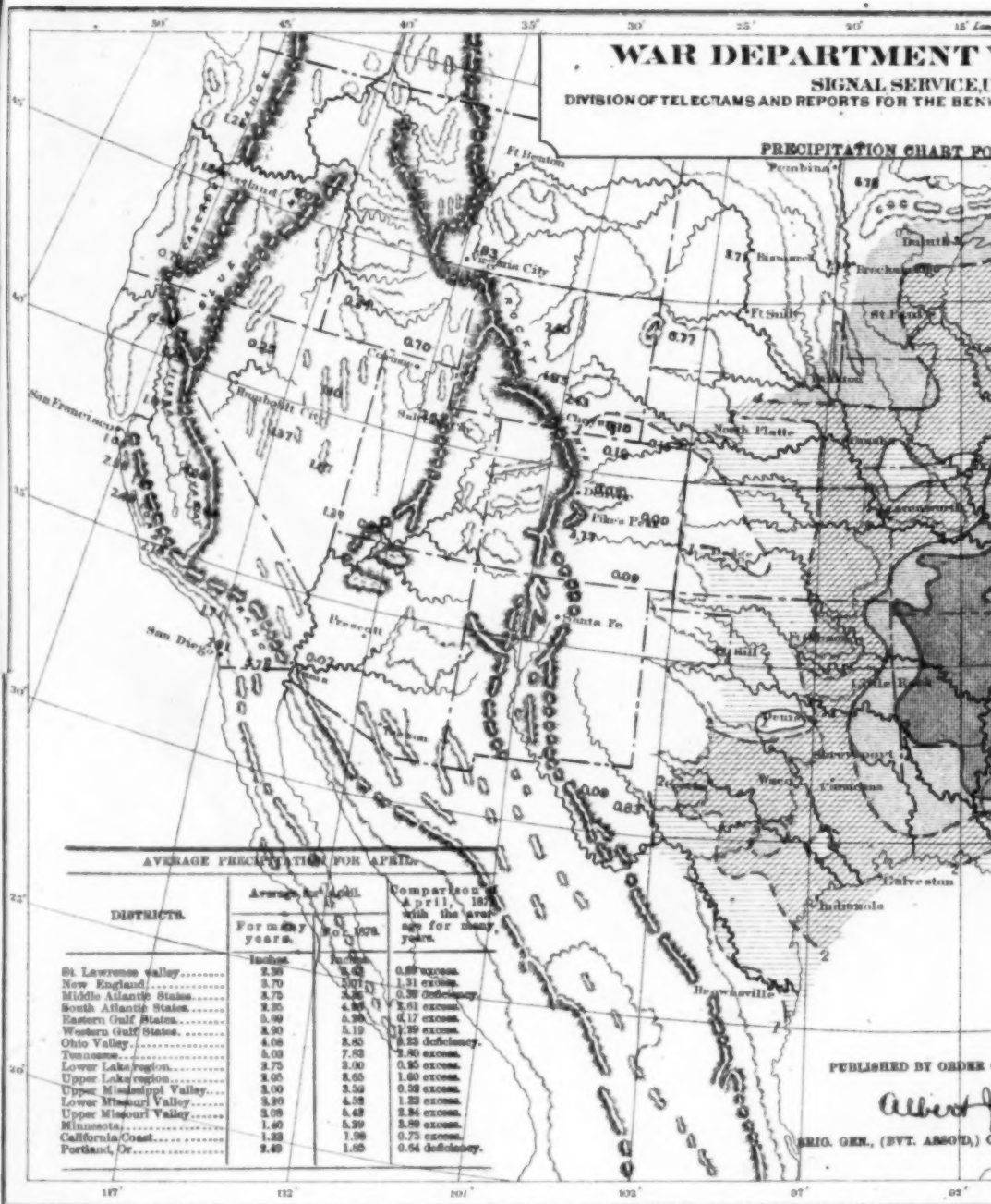
Albert J. Meyer

(T. ARSOTA) CHIEF SIGNAL OFFICER, U. S. A.

87 Long. West from 82 Greenwich

WAR DEPARTMENT
SIGNAL SERVICE, U. S. ARMY
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF THE ARMY

PRECIPITATION CHART FOR APRIL, 1907



AVERAGE PRECIPITATION FOR APRIL

DISTRICTS	Average for April		Comparison of April, 1907, with the average for many years
	For many years	1907	
	Inches	Inches	
St. Lawrence valley.....	2.50	3.40	0.89 excess.
New England.....	3.70	5.07	1.31 excess.
Middle Atlantic States.....	3.75	3.36	0.39 deficiency.
South Atlantic States.....	3.35	4.85	1.51 excess.
Eastern Gulf States.....	3.99	5.95	1.97 excess.
Western Gulf States.....	3.30	5.19	1.89 excess.
Ohio Valley.....	4.08	3.85	0.23 deficiency.
Tennessee.....	5.03	7.53	2.50 excess.
Lower Lake region.....	3.75	3.90	0.15 excess.
Upper Lake region.....	3.65	3.65	1.00 excess.
Upper Mississippi Valley.....	3.00	3.50	0.50 excess.
Lower Mississippi Valley.....	3.30	4.58	1.28 excess.
Upper Missouri Valley.....	3.08	3.43	0.35 excess.
Minnesota.....	1.40	5.39	3.99 excess.
California Coast.....	1.33	1.96	0.63 excess.
Portland, Or.....	3.40	1.65	0.54 deficiency.

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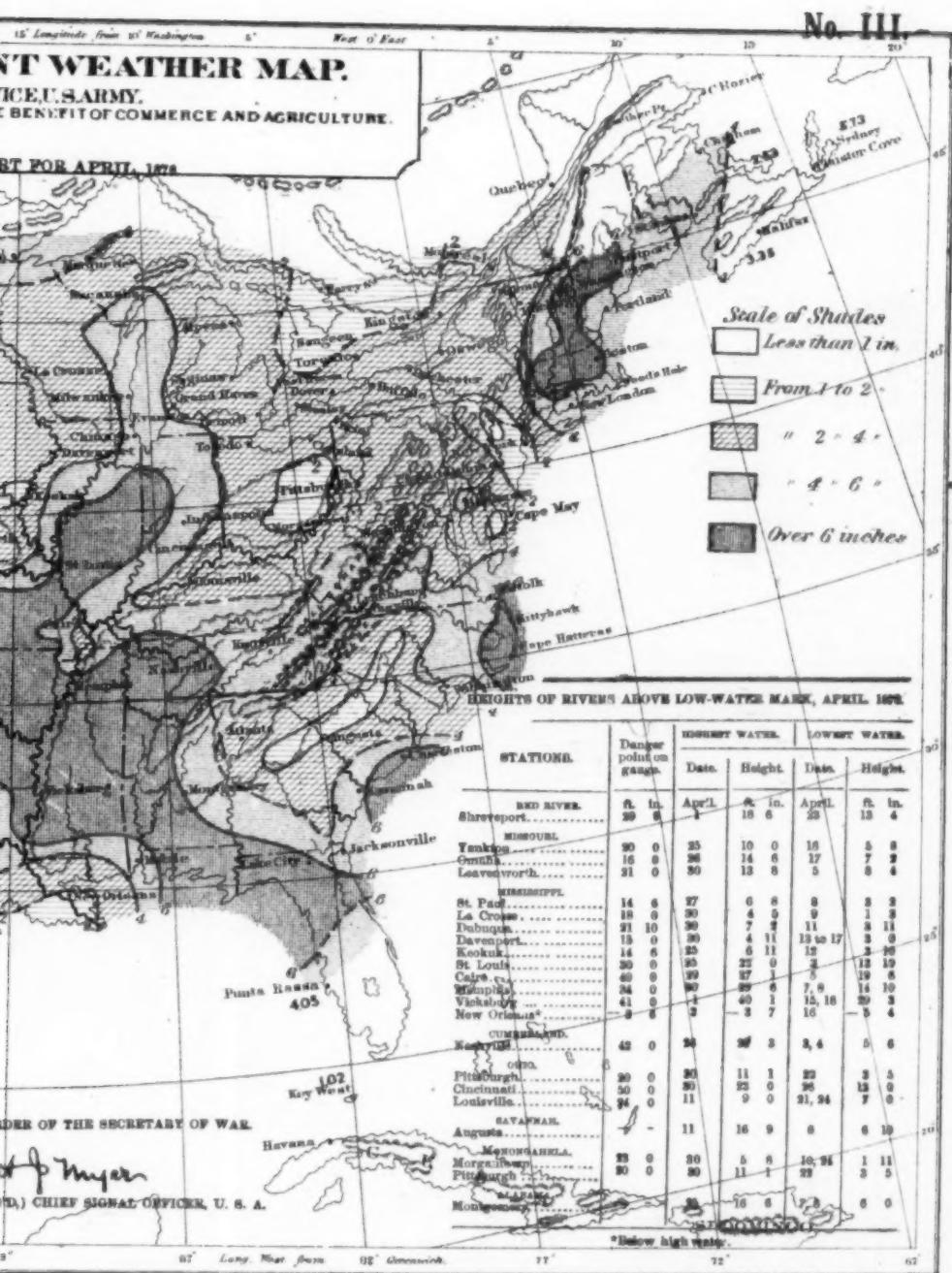
CHIEF, GEN. (EVT. ASSD.)

15° Longitude from W. Washington 5° West of East 10° 15° 20° 25°

ST WEATHER MAP.

ICE U. S. ARMY.
FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

ST FOR APRIL, 1878



ORDER OF THE SECRETARY OF WAR.

J. P. Meyer

CHIEF SIGNAL OFFICER, U. S. A.